

- To avoid closed loops (and multiple forwarding paths) in the Ethernet one uses the Spanning Tree Protocol (STP).
- The implementation of the protocol involves two steps: 1) election of the Root Switch, 2) topology convergence. The protocol has also the possibility to detect topology changes and to respond to these changes.
- The exchange of control information (control plane) between switches is carried out using special frames designated as BPDUs (Bridge Protocol Data Units).

Multicast (destination) address of a BPDU: 01 - 80 - C2 - 00 - 00 - 00

- Fields present in a BPDU: switch identifier (ID), root identifier (IDR), port ID, root path cost (C) and time-live. The switch identifier includes the switch priority + MAC address. The port ID field indicates the port number from which the BPDU was sent.

The root path cost (port cost) is obtained by adding the costs of all links between a switch port and a root port. As it is not advisable to route traffic in low capacity links the cost of a link is inversely proportional to its bit rate.

Cost recommended by IEEE



Bit rate	Cost
10 Mb/s	100
100 Mb/s	19
1 Gb/s	4
10 Gb/s	2